



**ERASMUS+ PROGRAMME 2014-2020**  
**Mobility of Individuals – Mobility of VET learners**

## Automation with Siemens LOGO!

### Description and Goals

Experiencing professional training in Germany, thus getting to know its culture and regional differences and specialties paired with the latest developments in education and the labour market in the automation sector are the essence of this training programme.

During the training course, the learners will develop basic understanding of automation technologies, their field of application and its functionality (e. g. analysing and programming, loop control, logic gates, digital/analogue signals). The learners will in particular work with Siemens PLC and the Logo! module: They will receive an introduction to the LOGO! module with its functions and configurations to work in the environment. On the basis of easy examples, the students will start to work with the module. With their progress, the examples will become more and more specialised and complex. At the end of the project, the students will present the results of their class to an audience. All topics will be covered by professionals formerly or currently working in that field, respecting the latest trends in that industry and applying a hands-on approach.

Given the wide range of topics a PLC can be used for, the focus can be shifted according to the target group.

In addition to the technical content of the programme the learners will get the chance to improve their language and soft skills and experience Dresden through cultural visits and other free time activities.

### Target group

VET Learners of public or private schools training in the field of "engineering" who would like to expand their skill set by discovering relevant aspects and approaches of training in that field in Germany as well as German culture.

The intensity and complexity of the Units can be varied according to the previous knowledge and qualification of the participants.

### Learning outcomes

#### Professional Competences

##### *Unit 1: Defining automation technology*

- Describing automation theory defining e. g. the differences of control, open loop control, and closed loop control
- Describing the difference between digital signal and analogue signal
- Analysing logic circuits understanding graphic symbols for the different logic gates: AND, OR, NOR, NOT, NAND, NOR, XOR, XNOR
- Applying the "Karnaugh-Veitch diagram" (KV-diagram) to develop the logic function without simplification

##### *Unit 2: Setting up the PLC Siemens Logo!*

- Connecting and setting up the hardware of the Programmable Logic

### General Information

#### Place

WBS TRAINING AG  
Dresden (other places on request and availability)

#### Duration

2 weeks, lessons from Monday – Friday 9.00 – 14.30 (longer hours are possible on request)

**Number of participants**  
14-20

#### Training Language

English (level A2 required)

### Contact

For further information on the training programme and for support with the project application, please feel free to contact:

WBS TRAINING AG  
Hugo-Junkers-Ring 5  
01109 Dresden  
GERMANY

#### Madeleine Diab

Coordinator International Education Projects

Fon +49 351 888 63 67  
Fax +49 351 888 63 50

Madeleine.Diab@wbstraining.de



- Controller (PLC) "Siemens Logo!"
- Acquiring knowledge about safety rules and observing them during the preparation of the work environment
- Setting up the software "Logo! Soft Comfort"
- Configuring the different applications of the PLC Siemens Logo!

### *Unit 3: Applying the Siemens LOGO! module and the software "Logo! Soft Comfort"*

- Programming and analysing with "Logo! Soft Comfort"
- Drawing and analysing open and closed loop controls
- Applying analogue and digital control technology
- Designing and practicing easy, medium, and difficult system applications, e. g.:
  - programming a school bell system (1 output, simple)
  - programming an exterior lighting (2 outputs, 4 inputs, 2 operations)
  - programming a shop window lighting (4 outputs, more conditions for inputs)
  - programming a sports hall lighting (complicated due to timers, logic functions for inputs and outputs)
  - programming the control of roll down shutters (more inputs than outputs; complicated conditions)
  - programming automatic feeders (special functions: asynchronous pulse generator, on-delay)
  - programming a domestic outdoor and indoor lighting system (6 inputs, 4 outputs; complicated conditions)
  - programming the alternation of two compressors (6 outputs, 6 inputs; medium complicated conditions)
  - programming a complex traffic light control system (big complicated program)
- Planning and implementing a project independently using the PLC Siemens Logo! and "Logo! Soft Comfort"

## **Personal Competences**

### *Unit 4: Giving a presentation on a professional topic*

- Researching information on the internet using filters, comparing sources and filing it in folders on the hard drive
- Defining the issues of a complex professional task and their solutions
- Preparing a presentation about the project work in MS PowerPoint
- Presenting the work results in English using adequate terminology

### *Unit 5: Working in a team confidently and self-responsibly*

- Setting work priorities and applying effective time management
- Sharing information with the team
- Listening to other team members' ideas and phrasing feedback adequately
- Assuming the own role and taking responsibility for own activities

## **Methods**

The practical training course uses a learner-centred approach. After an introductory lecture by the trainer, the learners will mainly work in pairs or groups to fulfil various tasks assigned to them by the trainer and their work group members in order to simulate real work situations.

## **Project Funding**

The costs for this training programme can be fully or partially (depending on the number of participants) covered by project funding from the Erasmus+ programme (Key Action 1: Mobility). Please contact your National Agency for information on funding details.



An essential element of the training is the project work, which the learners will carry out in groups, and which requires and improves skills such as autonomous work planning and team work. During the lessons the trainer as well as the learners will use different tools of visualization such as PowerPoint, pinboard, whiteboard and flipchart.

Other methods used in the training course will be:

- Brainstorming and mind mapping
- Observing and describing
- Group discussions
- Presentation and demonstration

## Assessment and Certification

In order to obtain reliable statements on whether all learning outcomes have successfully been achieved, a final assessment will be carried out. For this purpose, during the second week of their practical training, the learners will be assigned a practice-oriented task. This task will resemble a typical project work of the training field according to working life requirements. For the performance of this task, the learners will have to use their newly acquired knowledge, skills and competences. The participants will work in groups of 3 to 5 learners to complete their project work and will be supervised by their trainer. The actual assessment will take place on the last training day: The learners will give a presentation about their work, justifying the working progress and results.

To assess the work results, the trainer will work with standardised assessment sheets, which cover assessment criteria such as:

- Effective teamwork
- Correctness of work results
- Structure of the presentation as well as the quality and creativity of visualization

Upon successful completion of the mobility, the learners will receive a certificate by WBS TRAINING, supplemented by the description of learning outcomes according to the European Credit System for Vocational Education and Training (ECVET) principles. ECVET facilitates the transfer and recognition of learning outcomes acquired in another country and supports transparency of qualifications. WBS TRAINING also supports the sending organization in issuing the Europass mobility.

## Cultural Programme

Dresden offers a wide variety of cultural, free time and physical activities. With plenty of museums, such as the famous *Historic Green Vault*, the *Old Masters Picture Gallery*, the *Technical Museum*, or the *German Museum of Hygiene*, everyone's taste can be met. Parks and gardens with the option to relax, to work out or to play a ball game, picturesque viewpoints, and many other places of interest just wait to be discovered. Not to forget the city Dresden itself: More than 800 years old, the city looks back to a long and exciting history. The lively *New Town* as well as the *Old Town* with its historical buildings – mostly reconstructed and renewed after the World War II – and the river *Elbe* are definitely worth seeing!

We will provide you an overview about all the things in and around Dresden and help you to decide, what to do. Depending on entrance fees, extra costs for transport, and/or different costs for services, additional expenses may arise.

## Accommodation and Subsistence

Accommodation, subsistence, public transport tickets and cultural programme can be organised according to your wishes.

Please see financial offer for further details of the included services.



## Programme proposal Automation with Siemens LOGO!

Date	Programme
Sunday, Day 1	<b>Welcome</b> at Dresden Airport/Main Station <b>Arrival</b> at Hostel
Monday, Day 2	<p><b>09:00 – 09:30 Introduction</b></p> <ul style="list-style-type: none"> <li>- Presentation of the host organisation</li> <li>- Clarification of organisational issues</li> <li>- Introduction of the project and the tasks for the following weeks</li> <li>- Introduction to the Training Course</li> <li>- Meeting your trainer</li> </ul> <p><b>09:30 – 14:30</b> Conducting a previous knowledge test on automation <b>Defining automation technology:</b></p> <ul style="list-style-type: none"> <li>- Describing automation theory defining e. g. the differences of control, open loop control and closed loop control</li> </ul> <p><b>Afternoon: Cultural Programme:</b></p> <ul style="list-style-type: none"> <li>- Guided tour in the old town</li> </ul>
Tuesday, Day 3	<p><b>09:00 – 14:30 Defining automation technology:</b></p> <ul style="list-style-type: none"> <li>- Describing the difference between digital signal and analogue signal</li> <li>- Analysing logic circuits understanding graphic symbols for the different logic gates: AND, OR, NOR, NOT, NAND, NOR, XOR, XNOR</li> </ul>
Wednesday, Day 4	<p><b>09:00 – 14:30 Defining automation technology:</b></p> <ul style="list-style-type: none"> <li>- Applying the "Karnaugh-Veitch diagram" (KV-diagram) to develop the logic function without simplification</li> </ul> <p><b>Setting up the PLC Siemens Logo!:</b></p> <ul style="list-style-type: none"> <li>- Acquiring knowledge about safety rules and observing them during the preparation of the work environment</li> <li>- Connecting and setting up the hardware of the Programmable Logic Controller (PLC) "Siemens Logo!"</li> </ul>
Thursday, Day 5	<p><b>09:00 – 14:30 Setting up the PLC Siemens Logo!:</b></p> <ul style="list-style-type: none"> <li>- Setting up the software "Logo! Soft Comfort"</li> <li>- Configuring the different applications of the PLC Siemens Logo!</li> </ul> <p><b>Applying the Siemens LOGO! module and the software "Logo! Soft Comfort":</b></p> <ul style="list-style-type: none"> <li>- Drawing and analysing open and closed loop controls</li> <li>- Applying analogue and digital control technology</li> <li>- Designing and practicing easy system applications: <ul style="list-style-type: none"> <li>a) Programming a school bell system (1 output, simple)</li> <li>b) Programming an exterior lighting (2 outputs, 4 inputs, 2 operations)</li> </ul> </li> </ul>
Friday, Day 6	<p><b>09:00 – 14:30 Applying the Siemens LOGO! module and the software "Logo! Soft Comfort":</b></p> <ul style="list-style-type: none"> <li>- Finishing to programme an exterior lighting (2 outputs, 4 inputs, 2 operations)</li> </ul>



Date	Programme	
		<ul style="list-style-type: none"> <li>- Programming a shop window lighting (4 outputs, more conditions for inputs)</li> </ul>
Saturday, Day 7	Weekend at the disposal of the group, we will be happy to suggest cultural and other free time activities and to help organise a suitable programme.	
Sunday, Day 8		
Monday, Day 9	09:00 – 14:30	<b>Applying the Siemens LOGO! module and the software “Logo! Soft Comfort”:</b> Designing and practicing easy and medium applications: <ul style="list-style-type: none"> <li>- Programming a sports hall lighting (complicated due to timers, logic functions for inputs and outputs)</li> <li>- Programming the control of roll down shutters (more inputs than outputs; complicated conditions)</li> </ul>
Tuesday, Day 10	09:00 – 14:30	<b>Applying the Siemens LOGO! module and the software “Logo! Soft Comfort”:</b> Designing and practicing medium applications: <ul style="list-style-type: none"> <li>- Programming automatic feeders (special function, asynchronous pulse generator, on-delay)</li> <li>- Programming a domestic outdoor and indoor lighting system (6 inputs, 4 outputs; complicated conditions)</li> </ul>
Wednesday, Day 11	09:00 – 14:30	<b>Applying the Siemens LOGO! module and the software “Logo! Soft Comfort”:</b> Designing and practicing medium and complicated system applications: <ul style="list-style-type: none"> <li>- Programming the alternation of two compressors (6 outputs, 6 inputs; medium complicated conditions)</li> <li>- Starting programming a complex traffic light control system (big complicated program)</li> </ul>
Thursday, Day 12	09:00 – 14:30	<b>Applying the Siemens LOGO! module and the software “Logo! Soft Comfort”:</b> Designing and practicing complicated system applications: <ul style="list-style-type: none"> <li>- Finishing programming a complex traffic light control system</li> </ul> <b>Review on the newly acquired knowledge and skills</b> <b>Preparation of the final presentations on the individual project:</b> <ul style="list-style-type: none"> <li>- Preparing a presentation about the project work in MS PowerPoint</li> <li>- Developing project and presentational skills</li> </ul>
Friday, Day 13	09:00 – 12:30	<b>Preparation of the final presentations on the individual project:</b> <ul style="list-style-type: none"> <li>- Preparing a presentation about the project work in MS PowerPoint</li> <li>- Developing project and presentational skills</li> </ul>
	12:30 – 14:30	<b>Presentations, assessments, and farewell</b> <ul style="list-style-type: none"> <li>- Giving final presentations about the individual project work</li> <li>- Assessment of the newly acquired knowledge</li> <li>- Evaluation of the project and handing out certificates</li> </ul>



Date	Programme
Saturday, Day 14	<b>Departure</b>

**Training programme/Description of practical training units**  
**Suggestions for Cultural Programme/Free time activities**

Last update: 17.11.2016